

September 13, 1955

**CONTAINS SENSITIVE  
COMPARTMENTED INFORMATION**

HDM

Through the kind and mighty efforts of your friends in [ ] Jim finally got a plane back. He had the disquieting experience of reading my cable notifying him of the need for his presence in Rochester at the very moment we were gathering at the conference table. Apparently, the Irish do not believe in delivering cables and it was not until he got to [ ] and found my back-up duplicate that he was aware of the urgency of his coming. In any case, we spent a fine day yesterday. I made the attempt to bring him up-to-date as to what had been going on, and I am sure he will be in touch with you with the many questions that I could not answer. We went over the details of his work on the optical systems for us, and I would like to report the results here. 25X1

The 24" reworked lenses are quite satisfactory to him, and he remarked he felt we had done a much better job than he expected as far as performance of these improved lenses was concerned. I have, therefore, cleared these lenses for official delivery (previously I had had them only on approval).

We went over the results of the new design 24" prototype and Jim wishes to do a bit of re-examining of this design. He promises us some new information by the 23rd of September, which we will immediately put into the prototype and whistle back some new results. The first production run of eleven items of this lens was scheduled for delivery September 15. This no longer looks possible and if the change in design produces a satisfactory lens (satisfactory to JGB) it should be possible to make delivery of the first eleven units by the 15th of November with eleven per month thereafter until the last seven are delivered early in February. I will make an official request for a delivery date change when we get a look at the modified prototype.

The 36" lens for the "B" camera is in the same state. Jim feels the design needs some rework, and he will have the data back to us on the 26th of September, which we will then incorporate in the prototype. If test results then are acceptable, the delivery of the first item should be possible by November 1 rather than October 1 but in this case we might possibly deliver two lenses and two again in December, which will put us back on the contract schedule. This November 1 date for the first "B" lens is one which I am making every effort to meet since after that date it will control the delivery of the whole camera.

We examined very thoroughly the situation with regard to the "C" camera and have come to the conclusion that a projection type system is just not fitted for the camera which is involved. I feel it would be worthwhile to retrace the history, as I remember it, of this design. Originally back in December of last year the proposal was for a 240" focal length system operating at about f/20. By January, because of the physical limitation of the volume available, this system had been cut back to 200" still f/20. In February, when the weight problem was seriously faced, the system shrank to 180" focal length but still with a speed of around f/20. At this time the first indications of the aircraft angular motions were available and these proved to be so much larger than was originally contemplated that the exposure times would have to be shortened and the speed was increased to f/16. This change required a further shortening of the focal length because of the impossibility of increasing the diameters of the optics to affect the increase in speed. Between May and August discussions with EK people and the settling, at least in a very general way, of the

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amount of light available and the sensitivity of the film to be used, the speed was further increased to  $f/11$  by shortening the focal length to 120". By this time, the optical problem of making a projection system operating at  $f/11$ , with even the smaller 13x13 format, had become of proportions significantly greater than were originally contemplated when the proposal for a 240"  $f/20$  was made. We could probably return to something like 180" focal length  $f/20$  or maybe even a 200"  $f/20$  if we could be sure that the platform were stable enough to permit long exposures. No data is yet available although there is some hearsay indication that it may be much more stable than the numbers we have been provided with indicate. To get on with the problem, Jim and I have made the decision to replace the projection system, with its extremely complicated optics and its very nasty mechanical problems, with a more conventional system of 120" focal length operating at  $f/11$ . Jim is attempting to make the design for this system, which is really quite simple, available by October 1. I have initiated the necessary steps to inform our subcontractor and our own project people of this new decision. I will have available for you the effect on price and delivery as soon as these are available, which I hope will be in two weeks. I think we should re-examine the number of these "C" type systems to be built since Jim is very much in favor of returning to the original truly long focal length high resolution system when data on aircraft performance is available. I do not think this should be looked upon as a giving up of a difficult problem but rather as a sound engineering decision to accomplish the same end in a much simpler way for a higher possibility of initial success.

A second charting camera will be shipped tomorrow. This, as you remember, is actually the first production unit. The one now in place is a prototype. The second production unit will be available on the 19th of October, the third on the 2nd of November and then on the contract schedule. The only place I believe that we have really had great difficulty has been in the control portion of the periscope. The first periscope itself was shipped last Saturday and will provide a fixed view of the area under the aircraft. The hand control was held because of still unsatisfactory operation. The basic problem here is one of getting the proper feel. There is so much gearing, such long lengths of flexible cable and other attachments that it, to date, just has not felt right. We have been working night shifts and weekends, and I hope that I will have it under my arm Wednesday afternoon. TWM has taken off and by this time should be there to start assisting in the installation of equipment of number two.

I hope that you will have an opportunity to come out sometime during the period we will be there for Jim plans to try to make it. Tell your boss you are taking a couple of days off, which I am sure you need anyway, and come out and spend it in the sun.

Best personal regards.



rms/dmg